

Characterization of the Sunset Semi-Continuous Carbon Aerosol Analyzer

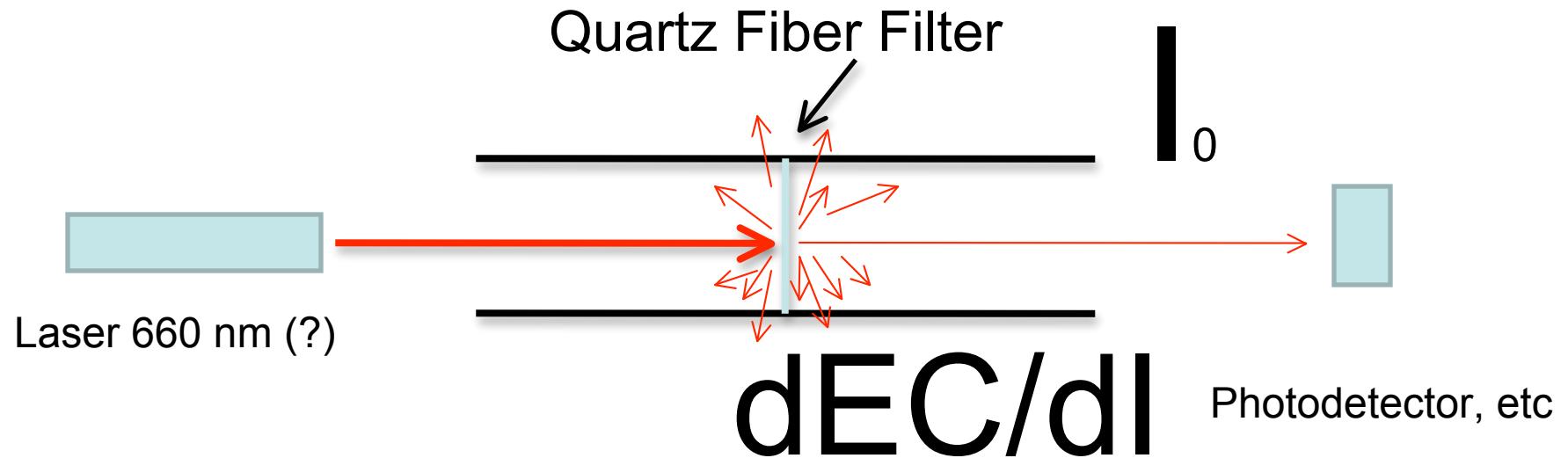
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Highlights

- Determine OC and EC using the Sunset OCEC field analyzer
- Determine LODs and RSDs using the Modified NIOSH protocol (i.e., 870 C max in He)
- Improved performance of the Sunset OCEC
- Related work
 - Publications
 - **Primary and secondary organic carbon downwind of Mexico City**, Atmos. Chem. Phys. Discuss., 9, 541–593, 2009
 - **Characterization of the Sunset Semi-Continuous Carbon Aerosol Analyzer**, Journal of Air & Waste Management Association, accepted for publication
 - Posters

Simplified TOA - Transmission



1. Measure Laser While Collecting
2. T.O. Analysis after Collection

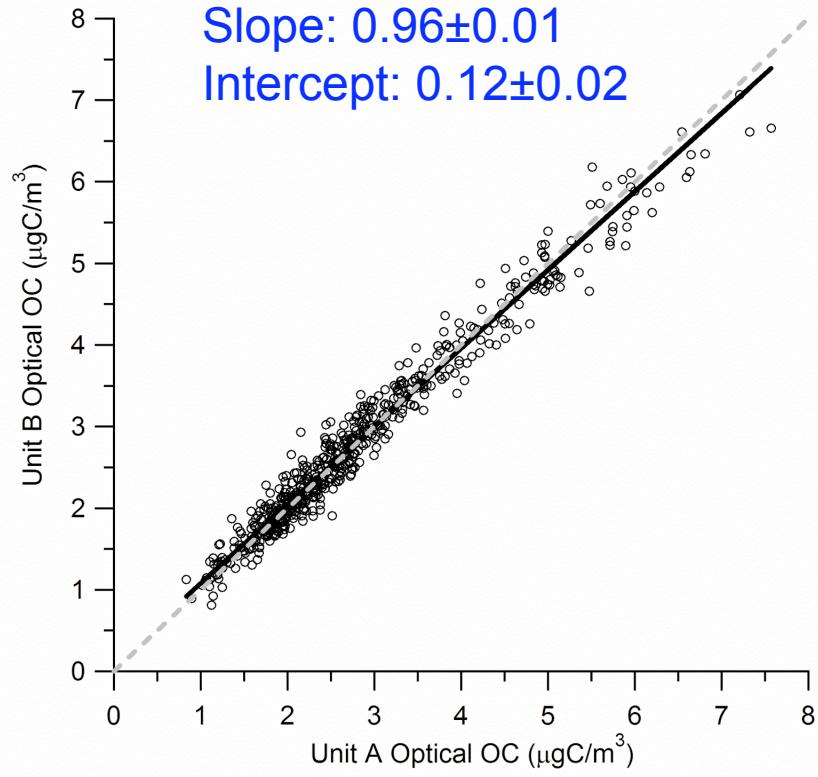
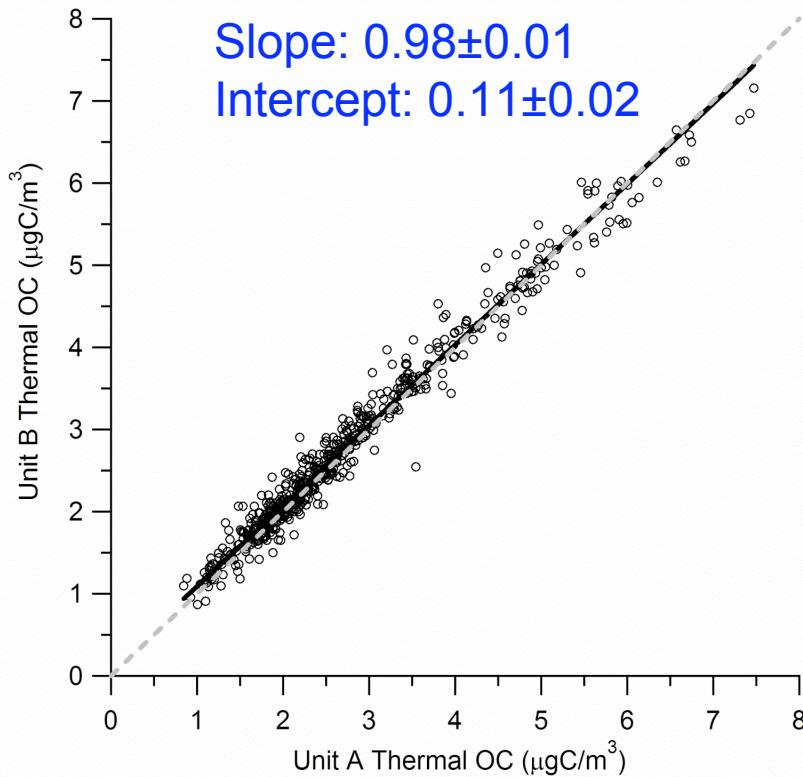
Limit of Detections (LODs)

	Unit A LOD, $\mu\text{gC}/\text{cm}^2$	Unit B LOD, $\mu\text{gC}/\text{cm}^2$
Thermal OC	0.1	0.2
Thermal EC	0.1	0.1
Optical OC	0.1	0.2
Optical EC	0.01	0.01
TC	0.1	0.2

Relative Standard Deviations (RSDs)

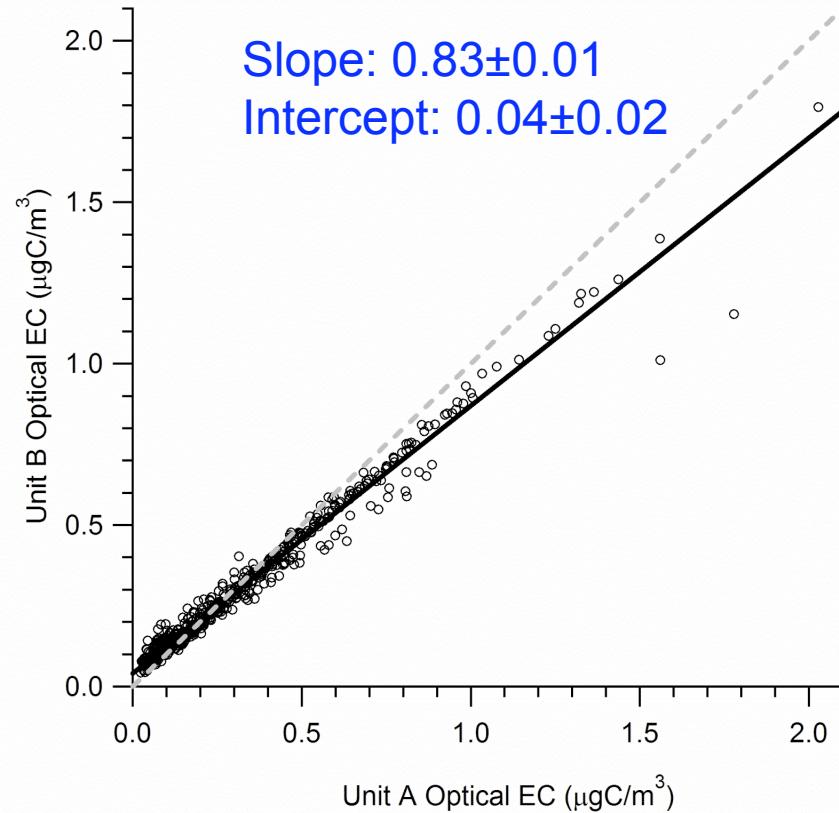
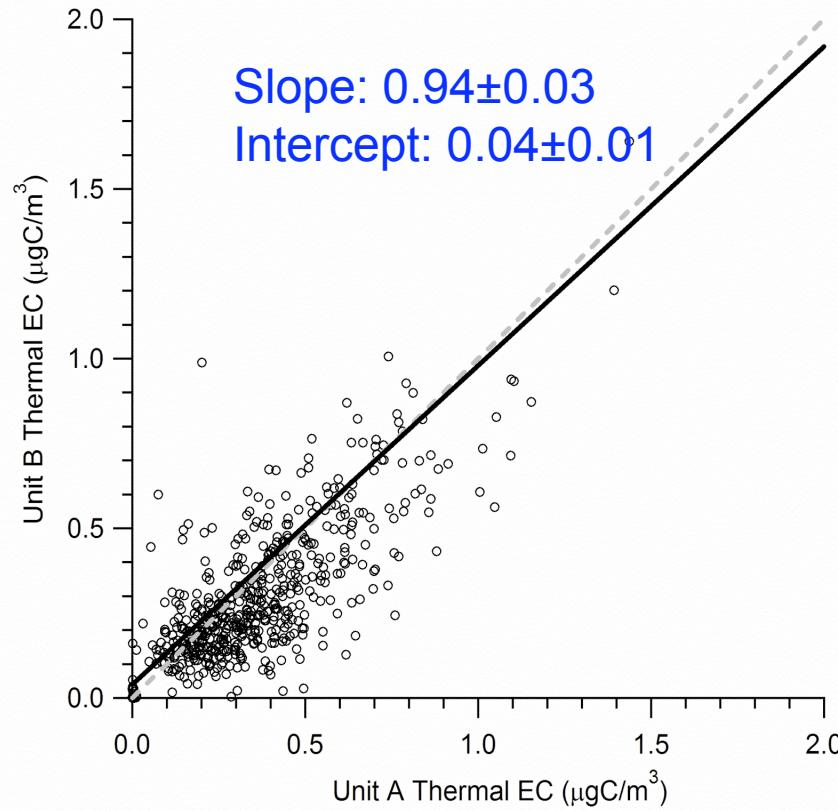
	N_s	C loading ranges $\mu\text{gC/cm}^2$	RSD (%)
Thermal OC	585	0.6 – 5.3	5.3
Thermal EC	319	0 – 1.2	24.3
Optical OC	585	0.6 – 5.4	5.6
Optical EC	295	0 – 1.4	9.6
TC	585	0.6 – 6.0	4.9

OC Comparison between Unit A and Unit B



- Deming Fit results are in good agreement with linear least-squares fit

EC Comparison between Unit A and Unit B

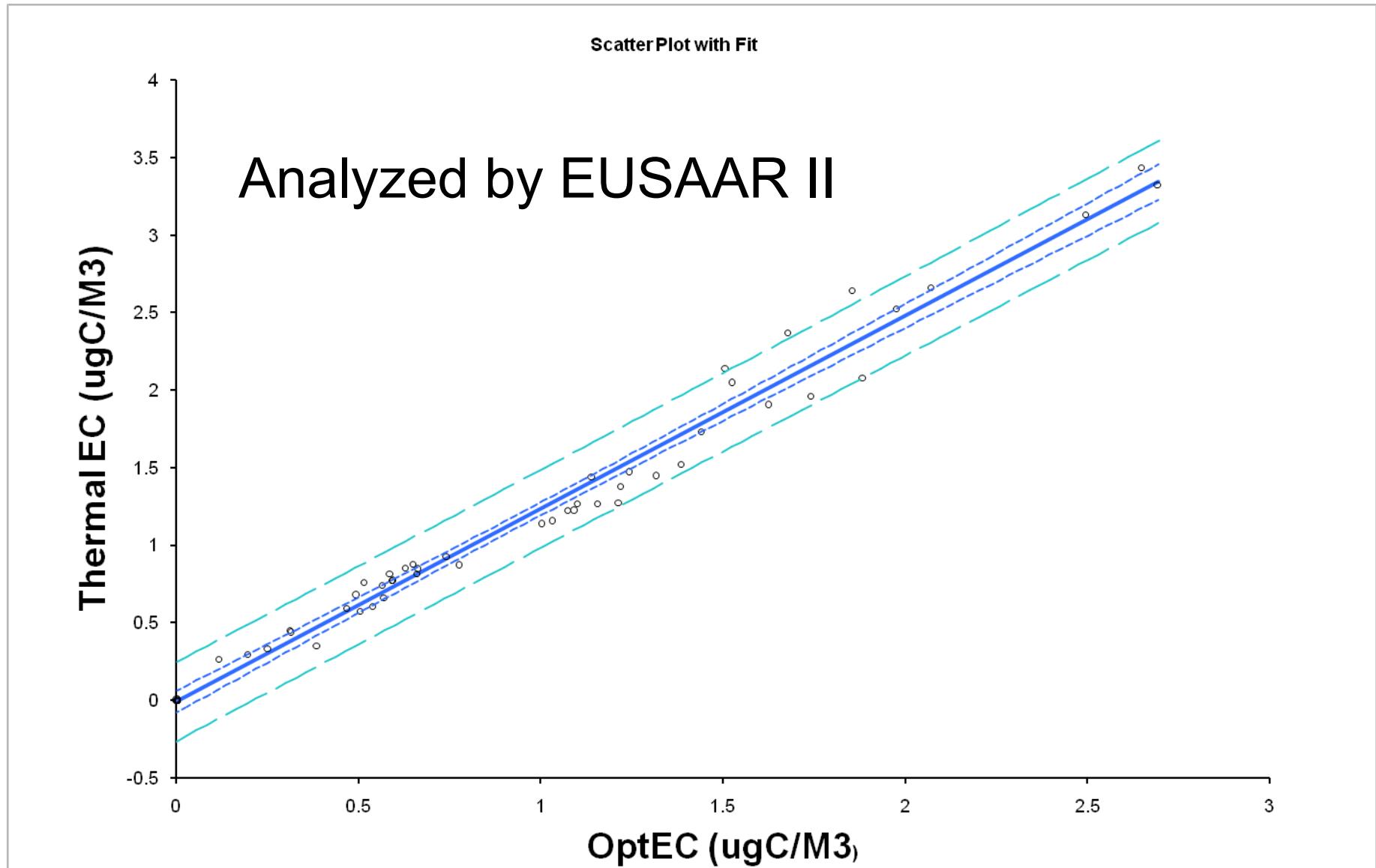


Future Work

- Compare NIOSH vs. STN thermal-optical protocols
- Compare NIOSH vs. IMPROVE thermal-optical protocols
- Improve Carbon Detector Sensitivity
- Improve Laser/Detector Sensitivity
- Compare Results with other wavelengths
- Publish results in peer-reviewed journals

Prague ThermEC vs. OptEC

Inst2



Prague TC, OC and EC comparison

